Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) A plasma etching reactor for deep silicon etching comprising a reaction chamber surrounded by a leakproof vertical wall, said reaction chamber containing a substrate support and communicating with a plasma source to form a plasma therein, said reaction chamber further comprising:

   a heater liner of a metal or alloy lining substantially all of the leakproof vertical wall of the reaction chamber in a non-leakproof manner, the heater liner coupled to a heater, and an intermediate thermal insulation space provided between the heater liner and the leakproof wall of the reaction chamber, wherein the heater liner consists of a metal or a metal alloy consisting of metal components and contacts the plasma;

   a first control device configured to execute alternate etching the substrate, comprising alternating steps of etching the substrate by a plasma of an etching gas, and steps of passivating surfaces by a plasma of a passivating gas; and

   a second control device configured to regulate the temperature of the heater liner, at least during the passivation steps, to a temperature higher than the condensation temperature of the one or more polymers generated by the plasma to reduce the effect of plasma heating on the deposition rate of the one or more polymers on the liner to minimize the change of the substrate etch rate over time.

2. (Previously presented) A reactor according to claim 1, characterized in that the metal or alloy is selected from metals and alloys that do not react with the fluorine-containing etching gas or the passivation gas to form volatile compounds.

3. (Previously presented) A reactor according to claim 2, characterized in that said metal is aluminum or titanium.

4. (Currently amended) A reactor according to claim 1, characterized in that it further comprises:

bias means for biasing the substrate support in order to control bombardment by particles coming from the plasma;

an etching gas source, and means for controlling the etching flow rate to govern the introduction of etching gas into the plasma source;

a passivation gas source, and means for controlling the passivation flow rate for governing the introduction of passivation gas into the plasma source; and

wherein the controller comprises a control device adapted to cause the etching gas flow rate control means and the passivation gas flow rate control means to operate in alternation.

5. (Previously presented) A reactor according to claim 1, characterized in that the heater liner is fastened to the leakproof wall of the reaction chamber by a small number of fasteners.

6. (Previously presented) A reactor according to claim 5, characterized in that the intermediate space between the heater liner and the leakproof wall of the reaction chamber communicate with the central space of the reaction chamber via an annular space of small thickness.

7. (Previously presented) A reactor according to claim 5, characterized in that the fasteners are of a material which opposes the transfer of heat energy by conduction from the heater liner to the leakproof wall of the reaction chamber.

8. (Previously presented) A reactor according to claim 5, characterized in that the heater liner is suspended from the leakproof wall of the reaction chamber by three projections having heads, projecting beneath the face of the leakproof wall and engaged in keyhole-shaped slots each having a wide portion and for passing a head and a narrow portion for retaining the head.

9. (Previously presented) A reactor according to claim 1, characterized in that the heater liner is thermally coupled to heater connectable to an external source of electrical energy.

10. (Previously presented) A reactor according to claim 9, characterized in that the heater comprises

electrical resistances which comprise thin-film electrical resistances and/or electrical resistances of the thermocoaxial type.

11. (Previously presented) A reactor according to claim 1, characterized in that the heater liner is heated by radiant heater means.

12. (Previously presented) A reactor according to claim 1, characterized in that the heater liner is associated with temperature-regulator means for regulating its temperature in a desired range of temperature values.

13. (Previously presented) A reactor according to claim 1, characterized in that the heater liner includes a heater suitable for heating it to a temperature higher than 150 C.

14. (Canceled)

15. (Previously presented) A reactor according to claim 1, characterized in that downstream from the substrate support the reaction chamber is limited by a conductive grid in thermal contact with the heater liner.

16. (Previously presented) A reactor according to claim 1, characterized in that the substrate support comprises electrostatic electrodes for attracting the substrate.

17 - 18. (Canceled)

19. (Previously presented) A reactor according to claim 2, characterized in that the metal or alloy is selected from metals and alloys that do not emit contaminating atoms under the effect of plasma bombardment.

20. (Previously presented) A reactor according to claim 1, characterized in that the leakproof wall comprises metal.

21. (Currently amended) A reactor <u>for deep silicon etching,</u> comprising a reaction chamber

surrounded by a metal leakproof wall, said reaction chamber containing a substrate support, said reaction chamber further comprising:

a heater liner of a metal or alloy lining substantially all of the leakproof wall of the reaction chamber in a non-leakproof manner, the heater liner coupled to a heater, and an intermediate thermal insulation space provided between the heater liner and the leakproof wall of the reaction chamber, wherein the heater liner consists of a metal or a metal alloy consisting of metal components and contacts the plasma;

a first control device configured to execute alternate etching the substrate, comprising alternating steps of etching the substrate by a plasma of an etching gas, and steps of passivating surfaces by a plasma of a passivating gas; and

a second control device configured to regulate the temperature of the heater liner, at least during the passivation steps, to a temperature higher than 150C.

22. (Previously presented) A reactor according to claim 21, characterized in that the metal or alloy of the heater liner is selected from metals and alloys that do not react with the fluorine-containing etching gas or the passivation gas to form volatile compounds.

23. (Previously presented) A reactor according to claim 21, characterized in that the heater liner is thermally coupled to one or more heaters connectable to an external source of electrical energy.

24. (Previously presented) A reactor according to claim 21, characterized in that the heater liner is associated with temperature-regulator means for regulating its temperature in a desired range of temperature values.

25. (Canceled)

26. (Currently amended) A reactor for deep silicon etching comprising:

a reaction chamber surrounded by a leakproof non-horizontal wall, said reaction chamber containing a substrate support and communicating with a plasma source to form a plasma therein, said reaction chamber further comprising: a heater liner of a metal or alloy lining

substantially all of the leakproof non-horizontal wall of the reaction chamber in a nonleakproof manner, the heater liner coupled to a heater, and an intermediate thermal insulation space provided between the heater liner and the leakproof wall of the reaction chamber, wherein the heater liner consists of a metal or a metal alloy consisting of metal components and contacts the plasma;

an etching gas source providing an etching action to a substrate under conditions of the plasma, and means for controlling the etching flow rate to govern the introduction of etching gas into the plasma;

a passivation gas source providing a passivation coating to the substrate under conditions of the plasma, and means for controlling the passivation flow rate for governing the introduction of passivation gas into the plasma; ~~and~~

a first control device configured to execute alternate etching the substrate, the control device adapted to cause the etching gas flow rate control means and the passivation gas flow rate control means to operate in alternation; and

a second control device further configured to regulate the temperature of the heater liner, at least during the passivation steps, to a temperature higher than the condensation temperature of the one or more polymers generated by the plasma to reduce the effect of plasma heating on the deposition rate of the one or more polymers on the liner to minimize the change of the substrate etch rate over time.